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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,544	09/24/2003	Kurt Wiesen	5123-550 (16420-02108)	5495

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EXAMINER

WATKO, JULIE ANNE

ART UNIT	PAPER NUMBER
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2627

DATE MAILED: 07/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/670,544

**Applicant(s)**

WIESEN ET AL.

**Examiner**

Julie Anne Watko

**Art Unit**

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_\_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 19-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 19-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 19-21, 24-26 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fontana, Jr. et al (US Pat. No. 6680832 B2) in view of Ho et al (US Pat. No. 6754056 B2).

As recited in claim 19, Fontana, Jr. et al show a read head (see Fig. 2), comprising: a GMR spin valve stack including at least a pinned layer 34, a free layer 38, and a pair of shields (10 and 13), one disposed on either side of the GMR spin valve stack, with one 13 of the shields being formed to include integral side shields (15 and 17) that substantially enclose the free layer between the pair of shields.

As recited in claim 19, Fontana, Jr. et al are silent regarding a stabilization layer including a pair of separated regions of patterned exchange bias material, each region of patterned exchange bias material being disposed over a respective one of opposite ends of the free layer.

As recited in independent claim 19, Ho et al show a stabilization layer (see Fig. 16) including a pair of separated regions (320 and 322) of patterned exchange bias material ("INSULATING AFM"), each region of patterned exchange bias material being disposed over a respective one (324 and 326, respectively) of opposite ends of the free layer 306.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the exchange bias regions of Ho et al to the head of Fontana, Jr. et al as taught by Ho et al. The rationale is as follows: one of ordinary skill in the art would have been

Art Unit: 2627

motivated to add the exchange bias regions to the head in order to suppress multidomain activity without stiffness by longitudinal biasing of the free layer as taught by Ho et al (see col. 2, lines 13-45) and as is notoriously well known in the art.

As recited in claim 20, Fontana, Jr. et al show that the GMR spin valve stack is configured to operate in a current perpendicular to plane (CPP) mode (“CPP”, see col. 3, line 43).

As recited in claim 21, Fontana, Jr. et al show that the pair of shields are electrically conductive (“permalloy ... Sendust, NiFeCo, and Co based amorphous alloys”, see col. 5, lines 5-10) and wherein the GMR spin valve stack includes an electrode 22 at the top thereof and an electrode 20 at the bottom thereof.

As recited in claim 24, Fontana, Jr. et al show a layer 14 of insulating material forming a gap between the pair of shields in the regions at either end of the GMR spin valve stack.

Regarding claim 25: The product by process limitations in these claims are directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessman*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final structure of the product “gleaned” from the process limitations or steps, which must be determined in a “product by process” claim, and not the patentability of the process limitations. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claimed in “product by process” claims or

Art Unit: 2627

not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear.

As recited in claim 26, Fontana, Jr. et al show that the gap layer 14 includes a portion that covers at least portions of the sides of the stack (see Fig. 2).

As recited in claim 37, Fontana, Jr. et al are silent regarding at least a portion of the electrode at the top of the GMR spin valve stack is located between the pair of regions of patterned exchange material.

As recited in claim 37, Ho et al show at least a portion of electrode L2 between a pair of regions of patterned exchange material ("INSULATING AFM").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a portion of an upper electrode of Fontana, Jr. et al between patterned exchange material as taught by Ho et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to ensure adequate electrical current flow between the GMR stack and the electrode, so as to ensure adequate sensing, and to provide an adequate volume of AFM material so as to ensure stable and adequate domain control and Barkhausen noise control as is notoriously well known in the art.

Furthermore, there is no invention in relocating known parts, when the functioning of the apparatus is not changed by the relocation. In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950).

3. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fontana, Jr. et al (US Pat. No. 6680832 B2) in view of Ho et al (US Pat. No. 6754056 B2) and further in view of Childress et al (US PAP No. 2003/0214763 A1).

Art Unit: 2627

Regarding claim 22: Although Fontana, Jr. et al disclose CIP sensors (see col. 3, line 36), Fontana, Jr. et al are silent regarding whether the GMR spin valve stack between the shields is configured to operate in a current in plane (CIP) mode.

Childress et al teach that magnetic tunnel junction sensors and CIP or CPP spin valve sensors are generally interchangeable (see ¶ 0004; see also ¶ 0048).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the tunnel junction with a CIP spin valve as taught by Childress et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to sense magnetic fields by spin-dependent scattering so as to reproduce stored data as is notoriously well known in the art.

Regarding claim 23: Electrically conductive leads that are in a gap formed between the pair of shields are inherent to the CIP spin valve of Childress in the location between the shields of Fontana, Jr. et al. See rationale and motivation for combining teachings above for claim 22.

4. Claims 27-29, 32-36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fontana, Jr. et al (US Pat. No. 6680832 B2) in view of Takahashi et al (US Pat. No. 6870718 B2).

As recited in independent claim 27, Fontana, Jr. et al show a read head (see Fig. 2), comprising: a GMR spin valve stack including at least a pinned layer 34 and a free layer 38, a pair of shields (10 and 13), one disposed on either side of the GMR spin valve stack, with one 13 of the shields being formed to include integral side shields (15 and 17) that substantially enclose the GMR spin valve stack between the pair of shields.

Art Unit: 2627

As recited in claim 27, Fontana, Jr. et al are silent regarding an insulated layer of permanent magnet material disposed between the shields and abutting the free layer.

As recited in claim 27, Takahashi et al show an insulated (see 503 and 501) layer of permanent magnet material 502 disposed between the shields and abutting the free layer (part of 105; see col. 6, lines 25-43, especially line 36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add an insulated layer of permanent magnet material between the shields of Fontana, Jr. et al as taught by Takahashi et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to improve reproducing resolution (see col. 3, lines 15-17), to prevent shunting loss (see col. 2, lines 26-31), and to reduce Barkhausen noise by establishing effective magnetic domain control (see col. 1, line 58-col. 2, line 9) as taught by Takahashi et al.

As recited in claim 28, Fontana, Jr. et al show that the GMR spin valve stack is configured to operate in a current perpendicular to plane (CPP) mode.

Regarding claim 28: See teaching above for claim 20.

Regarding claim 29: See teaching above for claim 21.

Regarding claim 32: See teaching above for claim 24.

Regarding claim 33: See teaching above for claim 24.

Regarding claim 34: See teaching above for claim 25.

Regarding claim 35: See teaching above for claim 26.

As recited in claim 36, Fontana, Jr. et al show that the GMR spin valve stack includes a free layer 38 having opposed ends (see Fig. 2).

Art Unit: 2627

Regarding claim 36: Fontana, Jr. et al are silent regarding whether a layer of permanent magnet material abuts at least a portion of the ends of the free layer.

See teachings, rationale and motivation for combining teachings above for claim 27.

As recited in claim 38, Fontana, Jr. et al show a read head comprising a GMR spin valve stack (see Fig. 2) including at least a pinned layer 34 and a free layer 38; a pair of shields (10 and 13), one disposed on either side of the GMR spin valve stack, with one 13 of the shields being formed to include integral side shields that substantially enclose the free layer between the pair of shields.

As recited in claim 38, Fontana, Jr. et al are silent regarding an insulated layer of permanent magnet material disposed between the shields and abutting opposite ends of the GMR spin valve stack.

As recited in claim 38, Takahashi et al show an insulated (see 501 and 503) layer of permanent magnet material 502 abutting opposite ends of the GMR spin valve stack.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add an insulated layer of permanent magnet material between the shields of Fontana, Jr. et al as taught by Takahashi et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to improve reproducing resolution (see col. 3, lines 15-17), to prevent shunting loss (see col. 2, lines 26-31), and to reduce Barkhausen noise by establishing effective magnetic domain control (see col. 1, line 58-col. 2, line 9) as taught by Takahashi et al.

5. Claims 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fontana, Jr. et al (US Pat. No. 6680832 B2) in view of Takahashi et al (US Pat. No. 6870718 B2) and further in view of Childress et al (US PAP No. 2003/0214763 A1).



See teachings, rationale and motivations for combining teachings above for claims 22-23

***Response to Arguments***

6. Applicant's arguments with respect to claims 19-38 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Art Unit: 2627

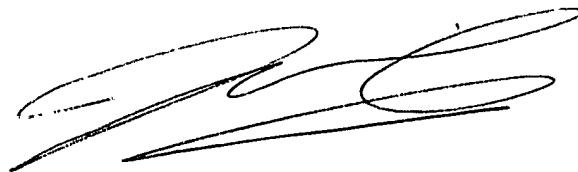
8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie Anne Watko whose telephone number is (571) 272-7597. The examiner can normally be reached on Monday through Thursday, noon to 10PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne D. Bost can be reached on (571) 272-7023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Julie Anne Watko, J.D.  
Primary Examiner  
Art Unit 2627

July 19, 2006  
JAW

A handwritten signature in black ink, appearing to be 'JAW', written over a horizontal line.